REMARKS

This communication is being filed to address the Final Office Action having a mailing date of May 26, 2004. No claims are being amended herein. Claims 1-20 are pending in the application. Claims 1, 8, and 15 are independent claims.

In the Final Office Action, independent claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Shiau (U.S. Patent No. 5,353,127) and a newly cited reference to Eschbach (U.S. Patent No. 5,045,952). Independent claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Shiau, Eschbach, and Yamada (U.S. Patent No. 6,172,768). Independent claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Shiau, Eschbach, and Itoh (U.S. Patent No. 4,982,292). The various dependent claims were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of various references cited in the Office Action. For the reasons set forth below, the Applicants respectfully disagree with these rejections and request that the pending claims be allowed.

More specifically, in section 3 (page 4), section 8 (page 7), and section 23 (page 15) of the Office Action, the Examiner has admitted that Shiau does not disclose the error value computed for a previous single one of the pixels, with regards to claim 1 for example. To supply these missing teachings of Shiau, the Examiner has cited Eschbach. The Applicants believe that this is an improper combining of references, as will now be explained.

A.   Combining Shiau with Eschbach would not result in the invention claimed in claims 1, 8, and 15

On column 3, lines 35-37, Eschbach appears at first glance to disclose an error diffusion algorithm using an error calculated based upon a preceding pixel. From this section of Eschbach, the reader may believe that Eschbach indeed discloses the limitation found in the Applicants' claims 1, 8, and 15. However, a closer reading of Eschbach reveals that Eschbach does not disclose this limitation and cannot be properly combined with Shiau.

On column 5, lines 51-57 of Eschbach, it is stated that the described embodiment "is limited to a 1-dimensional representation for the sake of a simplified explanation..." (emphasis added). In a display implementation (e.g., a 2-dimensional situation, such as a digital image formed of rows and columns), Eschbach requires a more complicated algorithm that uses

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more than just the error calculated based upon a single preceding pixel. For instance, in discussing the threshold level T (which is used in the error calculation in Figure 3 of Eschbach), Eschbach states on column 5, lines 61-64 that "the threshold level T, while illustrated as a function of a single input pixel, can be implemented as a function of a plurality of input pixels representing a region or neighborhood within the continuous tone input image" (emphasis added). Thus, it is clear that for a 2-dimensional image region, Eschbach requires the use of a plurality of pixels as inputs.

Claims 1, 8, and 15 recite in varying language an "error value computed for a previous single one of the pixels." These claims further recite, using varying language, a "digital image having pixels arranged in rows and columns." As described above, these are features that are not disclosed, taught, or suggested by Shiau, Eschbach, or any of the other cited references. Eschbach does not use a single preceding pixel in its error calculation for a 2-dimensional image. Eschbach's disclosed embodiment is a simplified algorithm for a 1-dimensional image. Therefore, combining the multiple-pixel algorithm (for a 2-dimensional image) of Eschbach with the 2-dimensional image of Shiau would not result in the "single pixel" feature claimed in claims 1, 8, and 15. Therefore, these claims are allowable over the cited references.

B.   Eschbach teaches away from making such a combination

As described above, Eschbach's disclosed embodiment is a simplified algorithm for a 1-dimensional situation. Because Shiau relates to a 2-dimensional situation, a person skilled in the art would not look to the 1-dimensional example disclosed by the Eschbach to apply its 1-dimensional error technique to the 2-dimensional image of Shiau.

An alternative way to look this scenario is based on Section A above: A person skilled in the art may perhaps use the 2-dimensional situation of Eschbach, which would require a more complicated algorithm that computes error values based on more than just a single preceding pixel (i.e., computes error values based on a plurality of pixels), with the 2-dimensional image of Shiau. However, the resulting algorithm would compute errors based on multiple pixels. Thus, if there is a motivation or teaching to combine the references, such a teaching only involves a 2-dimensional algorithm (Eschbach, which uses multiple pixels) applied to another 2-dimensional algorithm (Shiau)—but does NOT in any way, shape, or form teach a

combination of a single pixel error calculation for a 2-dimensional image. Accordingly, claims 1, 8, and 15 are allowable over the cited references based further on these distinctions.

C.   Other claim limitations

Claim 1 recites "a weighting coefficient depending on a position of a current pixel in the image." Claim 8 recites "a selected weighting coefficient for a current pixel." Claim 15 recites first and second correction coefficients "based on a position of [their] corresponding pixel." These are features that are not disclosed, taught, or suggested by Shiau, Eschbach, or any of the other cited references, even if the references are combined in the manner performed by the Examiner.

For example, Eschbach only states that "various weighting techniques may be used" on column 3, line 25. Shiau teaches using fixed weighting coefficients (for example, 0.5 for weighting the error of the pixel immediately preceding the current pixel) on column 3, line 27. These and the other references are completely silent with regards to a varying weighting coefficient that changes or is otherwise dependent based on a current pixel. Accordingly, claims 1, 8, and 15 are allowable over the cited references based further on these distinctions.

D.   Conclusion

Overall, none of the references singly or in any motivated combination disclose, teach, or suggest what is recited in the independent claims. Thus, given the above amendments and accompanying remarks, the independent claims are now in condition for allowance. The dependent claims that depend directly or indirectly on these independent claims are likewise allowable based on at least the same reasons and based on the recitations contained in each dependent claim.
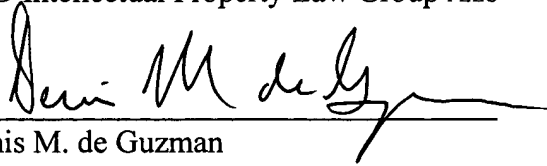
If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to the allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 622-4900.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable.
Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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